and is now functioning under the authority contained in this act. It is not necessary here to discuss in detail the essential features of this service. That has been done from time to time in other papers. Broadly speaking, the service is simply an extension of that already organized for general public activities. At different times in the past special needs have arisen, such, for example, as those for protection of fruit from frost, forests from fires, marine shipping from storms, certain areas from floods, etc. In each case the basic weather service already in existence was adapted and intensified to meet those special needs. So with aeronautics. The chief difference is that in this new activity the factor of danger to life and property is more acute than in ordinary pursuits. It has therefore been necessary to make the service more detailed and intensive. Observations are more numerous and forecasts are for shorter periods. Special attention is given to those conditions which are of chief importance, such as fog, low clouds, poor visibility, and thunderstorms.

Naturally the efficiency of the service depends in large measure on the speed with which the reports and forecasts are made available to pilots. The Department of Commerce, in cooperation with the Weather Bureau, has organized a system of communications which meets the need very effectively. About 13,000 miles of airways now have continuous teletype service. At important terminal airports on these airways and also on about 12,000 miles which do not yet have teletype service, radio stations have been established, partly for exchange of reports but chiefly for broadcasting information and forecasts to aircraft in flight. Thus, to the extent that is possible with appropriations made for the purpose, pilots are provided with up-to-the-minute reports and forecasts based thereon *before* each flight and with supplementary reports and forecasts at frequent intervals *during* each flight.

Only an extreme optimist would claim that the present service is the ideal. The service is only about 5 years old. During that period there has been much experimentation, with changes resulting as suggested by experience. There is reason to believe that the basic and essential features are sound and will probably endure, but there are bound to be changes in details as new ideas and methods are proposed. We should, and undoubtedly shall, in the future as in the past, adopt such changes as are shown to be superior to present methods in making aeronautics as safe and efficient as possible.

MOUNTAIN AND VALLEY ATMOSPHERIC-DUST MEASUREMENTS

By IRVING F. HAND

[Weather Bureau, Washington, July 1933]

Although a fairly comprehensive series of atmospheric-dust measurements have been made from airplanes (see MONTHLY WEATHER REVIEW for March 1924, vol. 52, pp. 133–139), but few comparative readings have been obtained from mountain tops and valleys below. Table 1 gives the results of five readings obtained on June 25 and 26, 1933, from the windward side of Skyland Drive at Crescent Rock, Va., on the Blue Ridge, at an altitude of 3,500 feet and from a point 2,600 feet below in the valley to the east 1 mile WSW of Syria at the foot of Dark Hollow.

While the number of observations is small, they tend to show the result of convection with increase of solar altitude. The number of particles in the valley seems rather high for free country air, but that may be owing in part to the large number of spores present. These measurements were made near dense forest growth. Moreover, while traffic was light on the road nearby, the infrequent cars that did pass raised considerable dust.

A slight rain fell shortly before the 1 p.m. reading of the 25th and again a little later the following day. On both days thunderstorms were seen in Page Valley west of the ridge toward evening.

The visibility was from 15 to 20 miles from Crescent Rock on both days. However, photographs on infrared films taken through a dense and very dark red filter show the Appalachian Range of mountains 30 to 40 miles to the west.

Perhaps the larger number of dust particles than might be ordinarily expected in free mountain air may account to some extent for the typical blueness for which the three ranges—the Blue Ridge, the Massanutten, and the Appalachian Mountains—are noted.

All measurements were made with the Owens dust counter, a description of which will be found in the issue of the REVIEW above cited.

TABLE 1.—*Summary of atmospheric-dust measurements*

Date and time	Location	Height above sea level	Clouds	Wind	Number of dust particles per cubic centimeter
		Feet			
June 25:					
9:00 a.m.	Rose River	900	4 st. cu.	Lt. w.	729
10:00 a.m.	Crescent Rock	3,500	7 st. cu.	Lt. w.	277
1:00 p.m.	do.	3,500	9 st. cu.	Moderate w.	519
June 26:					
9:00 a.m.	do.[1]	3,500	Fog below; few fr. cu. above.	Calm	183
Noon	Rose River [2]	900	10 st.	Lt. var.	485

[1] Crescent Rock is about 1 mile from the tip of Hawk's Bill Mountain, the highest peak in the National Park of Virginia. From this point a commanding view toward the west is obtained.

[2] Rose River is a mountain stream. Near the place where the readings were obtained are a few scattered homes. The nearest town is Syria with a population of less than 100.